must result in many invalids being deprived of a luscious and digestible food, and last, but not least, help to belittle science by reasoning which the common sense of centuries shows to be absurd.

Contrast all this with the calm attitude of the scientific *British Medical Journal*, which contents itself, according to the quotation from it, with calling for scientific investigation of the reason for some beds being polluted.* It seems quite likely that isolated oyster beds might be contaminated with bacilli, but the natural history of the oyster shows that he could not exist under such conditions, and that the bed would die out. In fact, the danger will apparently regulate itself.

I hope that these remarks will draw the attention of practical biologists, competent to set the question at rest; at the same time they will serve to show the great need of at least an elementary knowledge of science among our doctors before they presume to settle questions of the food supply of mankind; and they will serve to show the great lack of that knowledge among the rank and file of practitioners, who, at any rate, 'out west,' appear rather to glory in it.

George Chas. Buchanan.

CEREBRAL LIGHT.

In darkness or with closed eyes we can always see irregular forms of light in our visual field. These forms are of various kinds, series of waves, successive rings that spread and break, etc. In addition to these definite figures there is always more or less definite irregular illumination over the whole field. These phenomena are generally called the 'retinal light' or the '*Eigenlicht* of the retina.' They are usually supposed to arise from chemical changes going on in the retina. I wish to record some observations that apparently prove them to be cerebral and not retinal processes.

1. With closed eyes there is only one illuminated field, not two, as there should be from the two retinas if the light were retinal. Two retinal figures might appear as one under the conditions: (*a*) Of suppression of one field, which is not the case here, because it is impossible to keep one field suppressed for many minutes, whereas I have watched the retinal figures in uninterrupted continuance for a long time; (*b*) of perfect identity of form, which is hardly a possible supposition in the case of these irregular, volatile, chemical phenomena; (*c*) of sufficiently similar construction for union by stereoscopic vision, which also is not the case, as there is no relief effect in the picture.

2. The figures do not change in position when the eye is moved. They are localized in front and remain in the same place, even if the eyes are directed to one side. I find, however, that if the eyes are turned to a new position and kept there, the central figure (a spreading violet circle with a phosphorescent rim) will soon afterwards follow the movement; there is thus a tendency for this figure to occupy the spot of sharpest vision.

3. The figures do not change in location when the eyes are displaced. When the eyes are looking at some definite object, *e. g.*, this page, a pressure of the finger on one of them will cause the page apparently to move. This is true whether the other eye is open or closed. Likewise, if an after-image is obtained, it will move upon pressure of the eyeball. The pressure displaces the eyeball and changes the projection of the retinal picture. This displacement does not occur with 'retinal light.' I have repeatedly observed these figures and have manipulated the eyeballs; I have found that they are not in the slightest degree affected by the manipulations. In order to avoid all possibility of errors of observation, I have made the experiments in a series alternately with eyes open and eyes closed. With the eyes open I observed a dimly illuminated window; with them closed I saw the 'retinal' figures. The former always followed the displacements, the latter never.

These observations are, I believe, sufficient to establish the proposition (which I have not seen elsewhere) that the phenomena of vision usually known as 'retinal light' and 'retinal figures' are not originated in the retina, but in the brain. They should therefore be termed 'cerebral light' and 'cerebral figures.'

The following hypothesis seems also justified:

* *Cf.* The investigations by Professor Conn, of Wesleyan University, and of Professor Herdman, of Liverpool College.

The cerebral light is located in those higher centers of the brain which are connected with visual memories and imaginations. While watching the cerebral figures I find that my visual memories or phantastic figures appear in the midst of the cerebral light and frequently cannot be distinguished from them. The close connection of these cerebral figures with the contents of dreams has been repeatedly noticed by Johannes Müller and a series of later observers. There is also the possibility that the hallucinatory visions produced by hashish, mescal and other drugs may be simply modifications of this cerebral light.

E. W. SCRIPTURE.

YALE UNIVERSITY, May 21, 1897.

SCIENTIFIC LITERATURE.

Grundriss der Entwickelungsgeschichte des Menschen und der Säugethiere von DR. MED. OSCAR SCHULTZE. Bearbeitet unter Zugrundelegung der 2. Auflage des Grundrisses der Entwickelungsgeschichte von A. Kölliker. Leipzig, Engelmann. 1897. 8vo. Pp. vii + 468.

Kölliker's well known manual has been so thoroughly reworked by Professor Schultze that it is essentially a new work. In Kölliker's volume the embryology of the chick furnished many of the descriptions and illustrations. Schultze has omitted the chick altogether, confining himself strictly to mammalian development, and has added a comprehensive though very condensed account of the fœtal membranes and placenta in the chief groups of mammals. Many new and admirable figures have been added, of which a considerable majority are original and taken from the author's own preparations.

It is exceedingly difficult to characterize Professor Schultze's text-book fairly, for it combines superior merits with conspicuous and singular defects. It is utterly inadequate as a presentation of contemporary embryology, for it systematically neglects the morphological, phylogenetic and mechanical aspects of embryology, and consequently reads almost like an old-fashioned descriptive anatomy. An embryological writer might be excused for avoiding phylogenetic and mechanical themes, but the neglect of morphological considerations makes full success in writing a text-book an impossibility. To illustrate these criticisms it suffices to examine the account of the nervous system; in the development of this the history of the neuro blasts and of the division of the medullary tube into dorsal and ventral zones are the fundamental facts morphologically, but our author barely describes the neuroblasts, does not figure them at all, and makes no allusion to the two zones, which should form the basis of the whole account, for without understanding these zones no student can master even the rudiments of our present knowledge of the brain and spinal cord. Again, the epidermis is equally maltreated, for the history of the epitrichium is incorrect, and no mention whatever is made of the fact that the nails are modifications of the stratum lucidum. Erroneous are also the accounts of the development of the glands in the stomach, which do *not* develop in the same way as those of the intestine; misleading is the history given of the supra-renals, for the so-called medulla of the organ in the human species is not derived from the sympathetic *Anlage*. There are mistakes in the illustrations: in Figs. 194 and 195 the 'Zwischenhirn' (Diencephalon) is correctly designated, but in Figs. 217 and 263 the same division of the brain is called 'Mittelhirn' (Mesencephalon); in Fig. 327 the left side of the heart is called '*rechte* Kammer' and the right side '*linke* Kammer,' while the great vein is labeled 'Sympathicus!' Of the index complaint must be made: one searches it in vain for Hirnblasen, Nerven, Thyroidea and other headings.

In spite of these criticisms, which indicate that the usefulness of the book is severely limited, the manual remains one of many merits and of great value. The author is felicitous in his combination of brevity and clearness, and in avoiding cumbrous accumulations of details. The faulty illustrations are exceptions; very good ones indeed are the rule, good both in selection and execution. In printing them the publishers have sustained their high reputation in this regard. The author has studied at first hand, and is thereby enabled to make his descriptions fresh, vivid and interesting, and if he had included in his point of view